Case Report

Ocular necrotizing fasciitis due to *Pseudomonas aeruginosa* in a non-neutropenic patient

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**Abstract**

Eyelid necrosis is a very rare disease, usually secondary to trauma or infections. *Pseudomonas aeruginosa* (PA) eyelid necrosis remains principally a clinical diagnosis and it is often missed early in its presentation because of the difficulty in differentiating it from more common soft tissue infections. However, when the diagnosis is made we must act quickly due to the fatal evolution if not handled properly. We present the case of a non-neutropenic 53-year-old male patient with a history of alcoholism, smoking habit and lung cancer under chemotherapy treatment who developed ocular necrotizing fasciitis due to PA with perforation of his left eye and severe bilateral sclera ischemia despite intensive antibiotic treatment and surgical debridement.

**Keywords:** Bacterial conjunctivitis, Eyelid disease, Immunosuppression, *Pseudomonas aeruginosa*

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**Introduction**

*Pseudomonas aeruginosa* (PA) infection, caused by an aerobic, gram-negative, opportunistic rod, is a rare but potentially serious condition. Ocular and periocular infections resulting from PA species include blepharitis, conjunctivitis, keratitis, preseptal and orbital cellulitis, dacryocystitis, dacryoadenitis and endophthalmitis. Although uncommon, PA infection has also been associated with eyelid necrosis in relation to minor ocular trauma, systemic illness, malnutrition, alcoholism or cancer. In these cases, ocular involvement is usually bilateral and the evolution is fatal if not handled properly. Until now, only 10 cases have been reported, all of them associated with neutropenia.

**Case report**

A 53-year-old male patient with a history of alcoholism, smoking habit and a small cell lung carcinoma with bone and liver metastases, under chemotherapy and radiotherapy treatment during the last 15 days, was referred to our ophthalmology service because of bilateral purulent secretions and eyelid edema despite epithelizant ointment and antibiotic eyedrops during the last 24 h.

Physical examination revealed a significant eyelid edema with abundant greenish-hemorrhagic purulent secretions in both eyes. The slit lamp examination evidenced erosions in the upper and lower lid margins of both eyes with severe bilateral chemosis (greater in the left eye). Corneal epithelium was removed and no hypopyon was seen. The fundus...
necrotic tissue and no fungal structures. Predominantly in the posterior chamber, with abscessed histopathologic evaluation showed intraocular inflammation, parabulbar tobramycin injections in both eyes. Left eye was performed with debridement of the necrotic tissue and perforation of his left eye (Fig. 1B). Left eye enucleation examination was not possible due to the severe disruption of the anterior pole.

With the diagnosis of acute bilateral bacterial blepharocconjunctivitis, frequent eye washing was prescribed in association with local trimethoprim, diclofenac and epithelizant ointment every 4, 6 and 12 h respectively. However, 72 h later, the patient returned to the emergency room feeling worse and referring a noncompliance of the prescribed treatment. On this occasion, the patient showed a significant worsening in his ocular status with bilateral upper and lower eyelid tissue necrosis and periorbital skin involvement, the reason why he was hospitalized.

At admission, the patient was afebrile and cachectic. Analytical data showed mild leukocytosis (14000 WBC/mm³), no neutropenia, and associated anemia (9.7 g/dL). The rest of analytical parameters were within normal limits. Aureomycin ointment every 4 h, intravenous meropenem 1 g every 8 h and 60 mg/day oral prednisone in a descending dose were started. Subsequently, and because the conjunctival exudate culture was positive for PA which was sensitive to ceftacide and tobramycin, antibiotic eyedrops were changed and prescribed on an hourly basis in association with cycloplegic eye drops every 12 h besides intravenous antibiotic treatment and oral corticosteroids. On the contrary, blood cultures were negative and no fungi were found.

At the 8th day of admission the patient developed an almost complete ischemia of the nasal sclera of the right eye with the absence of conjunctiva (Fig. 1A) and corneal perforation of his left eye (Fig. 1B). Left eye enucleation was performed with debridement of the necrotic tissue and parabulbar tobramycin injections in both eyes. Left eye histopathologic evaluation showed intraocular inflammation, predominantly in the posterior chamber, with abscessed necrotic tissue and no fungal structures.

Despite intense ocular treatment, periodic debridements and the discontinuation of the chemotherapy regimen, the patient had a poor clinical ophthalmology outcome dying a month later due to his underlying disease.

**Discussion**

The eyelid necrosis is a very rare disease, usually secondary to trauma or infections. The most common organisms involved are *Streptococcus* and *Staphylococcus*. However, PA can also cause serious soft tissue infections in the context of neutropenia. With the compromise of defenses, PA can proliferate producing elastase, alkaline protease and exotoxins that can cause destructive infections that lead to the loss of the eye. However, facial involvement is exceedingly rare due to the excellent blood supply of this region.

PA eyelid necrosis remains principally a clinical diagnosis, and it is often missed early in its presentation because of the difficulty in differentiating it from more common soft tissue infections. However, we should take it into account when the patient is not responding to standard antimicrobial therapy, there are rapidly progressing skin changes and the patient is in some way immunocompromised. In such cases and as soon as the diagnosis of necrotising fasciitis due to PA is made, urgent surgical debridement is necessary together with high-dose systemic broad-spectrum antimicrobial therapy. Furthermore, for high risk patients empiric broad-spectrum antibiotics are mandatory, while waiting for species identification and susceptibility results, because time to initiation and completion of therapy remains the most important factor in patient outcome.

We must bear in mind that cancer and chemotherapy, regardless of the numbers of neutrophils, are a state of immunosuppression per se. For this reason we should consider delaying or reducing chemotherapy doses, when possible, or using colony-stimulating factors when patients develop serious infectious diseases or neutrophil levels fall below 1000 cells/mm³. These measures should always be accompanied by aggressive antibiotic treatment and surgical necrotic tissue resection when PA infection is suspected.

**Conflict of interest**

The authors declared that there is no conflict of interest.

**References**